FUNCTIONAL SYSTEM REQUIREMENTS

DRAFT CHANGES TO THE

GENERAL FUNCTIONAL SYSTEM REQUIREMENTS (GFSR)

AND THE

DETAILED FUNCTIONAL SYSTEM REQUIREMENTS (DFSR)

APPENDIX D

DRAFT CHANGES TO THE GFSR

PRC R-1209

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Prepared for

Department of the Army

Deputy Chief of Staff for Logistics

Director of Installations

FOREWORD

This appendix presents the results of the evaluation of the GFSR requirements as presented in DA Pamphlet 18-5, Development and Maintenance of Multicommand ADP Systems. This volume is an addendum to the Functional System Requirements—Draft Changes to the General Functional System Requirements (GFSR) and the Detailed Functional System Requirements (DFSR) report of April 1970.

APPENDIX D
DRAFT CHANGES TO THE GFSR

A. Introduction

This appendix presents draft changes to the General Functional System Requirements (GFSR). It provides a document that can be used for staffing and coordination within the Army and a basis for replacing the GFSR format in DA Pam 18-5.

Subsection B is drafted to replace Section III of Appendix E, "Requirements Documentation," DA Pam 18-5 (pages E-5 through E-9).

B. The Format for the General Functional System Requirement (GFSR)

The following format and instructions will be employed for the preparation of all GFSR's. An entry must be made for each chapter identified. However, if the chapter topic is not applicable to the system in question, then "not applicable" may be indicated. This section contains a detailed discussion of each chapter.

Chapter 1:	Introduction
Chapter 2:	Functional Structure
Chapter 3:	Organizational Structure
Chapter 4:	Jurisdictional Scope
Chapter 5:	Interface With Other Systems
Chapter 6:	Statutory and Other Regulatory Requirements
Chapter 7:	Operating Environments
Chapter 8:	Operating Policies
Chapter 9:	Workload Data
Chapter 10:	Performance Requirements
Chapter 11:	Required System Flexibility
Chapter 12:	Requirements for Back-up Capability
Chapter 13:	Level of Automation Envisioned
Chapter 14:	Description of Current System
Chapter 15:	Test, Installation and Conversion Concepts
Chapter 16:	Resource Requirements
Chapter 17:	Benefits To Be Achieved

Annex A: Definitions of Terms and Abbreviations

Annex B: Supporting Appendixes: Organization Charts, Mission and Function Statements, Workload Data Details, and other information supplementing the basic narrative.

Annex C: ADP Support Requirements Analysis (to be prepared by USACSC upon HQ DA approval of GFSR for multicommand systems; to be submitted with basic GFSR for command-unique systems).

1. Chapter 1: Introduction

In this chapter, introduce and generally describe the system proposed by the GFSR. The general description will be mainly a summarization of the more detailed chapters and an explanation of why the GFSR was developed.

a. System Title - Enter title, acronym and applicable DA reference number of the functional system described in this GFSR.

b. General Description of Functional Area - Identify in general terms the functions, objectives, location or area, major organizational components of the system, and the general scope of operations and support. This section will consist mainly of a summarization of the following chapters:

Chapter 2: Functional Structure
Chapter 3: Organizational Structure
Chapter 4: Jurisdictional Scope
Chapter 8: Operating Policies
Chapter 13: Level of Automation Envisioned
Chapter 14: Description of Current System(s)

c. Background - Briefly describe the events leading to the development and submission of this requirement.

d. Assumptions - Identify any significant assumptions upon which the fact, nature or success of the defined system is based, including new organizational or operational concepts that require higher-level approval. This section will consist mainly of a summarization of the following chapters:

Chapter 7·	Operating Environments
Chapter 15·	Test, Installation and Conversion Concepts
Chapter 16·	Resource Requirements
Chapter 17·	Benefits To Be Achieved

e. Constraints - Summarize the most significant constraints applicable to development or operation of the system, that are discussed in detailed form under appropriate headings.

f. Implementation Plan - An implementation plan should be developed and described, indicating all proposed target dates associated with the design, development, and implementation of the proposed system.

g. Security Requirement - Identify the required security classification of the proposed system.

h. Project Control - Identify the focal point for control of the proposed system design.

2. Chapter 2· Functional Structure

In this chapter, identify and describe the basic functions to be performed by the proposed system and the dependent relationships among the functions. This requires the definition and development of a hierarchical structure that is utilized to describe the logical breakdown of the system and the relationships and dependencies within the various functions of the system. In addition to narrative, flowcharts and diagrams should be utilized to identify and describe the system functions, and those parts that must be considered in ADP system design.

3. Chapter 3· Organizational Structure

In this chapter, identify by name or organizational type as appropriate the organizational units to be performing or directly supporting the functions indicated in Chapter 2. Describe the system-related mission and functions of each organization and the interrelationships among them. This description should also include an explanation of how the proposed management system fits into the total management area it supports. The intent here is to describe the organizational framework within which the system will operate.

4. Chapter 4· Jurisdictional Scope

In this chapter, define the operational and support limits of the system, in terms of geographical areas of operation, types of organizations supported, types of commodities, personnel, funds, or other subject-matter managed. This chapter should include charts, illustrations, and narrative that will describe the specifications for the reporting and command structure associated with the proposed system. The system reporting structure is the flow of system information between echelons and among organizations at an echelon. The reporting structure may or may not follow the command structure. The intent is to clearly delimit the scope of system operation and support in all terms appropriate to the application involved.

5. Chapter 5· Interface with other Systems

In this chapter, identify and describe the organizations, other than those listed in Chapter 3, and systems with which the proposed system must interface. Include the purpose of, or requirement for the interface, and the manner in which such interface is to be achieved. The form to be utilized in describing these external interfaces is shown in Exhibit D-1. For each external interface that utilizes a machine-readable medium as an exchange vehicle, a GFSR input or output description should be completed as described in Chapter 9. The intent of this chapter is to functionally identify the proposed system's relationship with the organizational structure of the Army and other existing or proposed Army systems. The entries on Exhibit D-1 which describe the external interfaces are as follows·

ENTRY	DESCRIPTION
External Interface	Identify and briefly describe the organization and/or system with which the proposed system must interface.
Purpose/Requirement	Describe the purpose and/or requirement for the identified external interface. Where applicable, identify Army or higher systems regulations.

External Interface:
Purpose/Requirement:
Exchange Vehicle:
Echelon Interface and Feedback:
Constraints:
Interface Trigger:
Frequency of Interface:
Security Classification:
Remarks:

EXHIBIT D-1: GFSR EXTERNAL INTERFACE DESCRIPTION

ENTRY (cont'd)	DESCRIPTION
Exchange Vehicle	Provide a narrative description of the exchange vehicle. Describe its purpose, exchange medium, how it is used, and provide references to the appropriate documentation describing the content of the vehicle.
Echelon Interface and Feedback	Enumerate the interfaces at each echelon using flowcharts to show the flow of information. Describe any feedback requirements which may be required by the proposed and/or external system.
Constraints	Describe any foreseeable operational problems and constraints associated with the interface which could impact on the system being described. This includes communications, limitations, accuracy of information, timeliness, use of different codes, etc.
Interface Trigger	Specify the conditions, actions, or cyclic events which cause the exchange of information.
Frequency of Interface	Indicate how often the exchange of information occurs, cite regulations or other authority which require the exchange of information.
Security Classification	Show the highest security classification of the information exchanged.
Remarks	Provide any additional information or comments that may aid in understanding the external interfaces.

6. Chapter 6: Statutory and other Regulatory Requirements

In this chapter, identify explicitly the nature, scope and effect of all current, pending or anticipated statutory and other regulatory requirements that govern the functions defined in Chapter 2, and that must be adhered to in system operations. This should include a matrix cross-referencing each identified statute/regulation to each function. This matrix may be presented in Annex "B" of the GFSR if it is too lengthy for inclusion in the basic narrative of this chapter. Discuss the "pending and anticipated" category of regulatory requirements as appropriate.

7. Chapter 7· Operating Environments

In this chapter, identify and discuss in detail each of the "operating environments" in which the system can be expected to operate, and the general impact of all but the designated "normal" environment on the system in question. For example, if the system is designed or required to operate with appropriate efficiency in peacetime limited or total war conditions, then define the general environment setup by each such condition and the role that the system plays in each, and the particular constraints imposed by each. The intent here is to describe the environment in detail and the impact on the system generally. The detailed impact on the various components of the system should be discussed in subsequent chapters, under appropriate subject headings.

Note that the difference between "operating environments" as described in this chapter, and the "required flexibility" specified in Chapter 11, is that an operating environment is assumed to be a general global or regional situation caused by external factors over which the system has little or no control but to which it must accommodate itself. "Flexibility" is simple that variability of approach, technique or policy that may be required within a given environmental setting and the selection of which is under system control.

8. Chapter 8· Operating Policies

a. In this chapter identify and describe the most significant operating policies that govern the day-to-day execution of the functions identified in Chapter 2. These would include the basic computational and logical techniques to be employed during system operations, and the checks and balances required in the system where the operating policies are specified in adequate detail in a regulation, reference to such regulation will be considered adequate. When the operating policies are not already specified by regulation, or when the regulatory requirement is quite generally expressed the operating policies should be defined.

b. The objective in identifying operating policies in this early stage of system definition and planning is twofold:

(1) To insure that in approving the GFSR, the HQ DA staff agencies clearly recognize how the assigned functions will be carried out, and that this proposed manner of performance is satisfactory.

(2) To provide the detail necessary for development of an ADP Support Requirements Analysis. To a great extent, the day-to-day operating policies of the system determines the general level and type of ADP support required.

9. Chapter 9: Workload Data

a. Input - Identify and describe the inputs which are currently required for the existing system to be automated and/or envisioned for the proposed system. For complex systems having many different inputs, describe only those that are of primary importance to the operation of the proposed system and those that impact heavily upon the system workload. The form to be utilized for describing inputs is shown in Exhibit D-2. The form provides for the possibility that an input may have one or more origination points and one or more processing destination points. The form may be supplemented using plain sheets if additional space is required for some entries, but the format of the form should be followed and information provided for each entry. The title of the entry should precede the additional information to prevent misinterpretation. The entries on Exhibit D-2 are described as follows:

ENTRY	DESCRIPTION
Input Title	Identify the input to be described with a clear and complete title. The title should be expressed in such a way that it will convey the content, not just a working title that will have meaning only to the writer.
Basis for Requirement	Briefly explain why the input is required citing those system activities or regulations that specify the requirement.

Input Title:					
Basis for Requirement:					
Input Trigger:					
Source Base:					
Security Classification:					
Disposition After Processing:					
Input Controls:					
Desired/Required Sequence for Processing:					
Average Number of Input Data Fields per Input Transaction:					
Type of Processing:					
Origin	Flow & Destination for Processing	Source Data Media	Frequency	Avg. No. of Input Transactions	Timeliness

EXHIBIT D-2: GFSR INPUT DESCRIPTION

ENTRY (Cont'd)	DESCRIPTION
Input Trigger	Describe the events that cause the input to be prepared.
Source Base	Identify the sources from which the data are extracted for preparation of the input. These sources could include documents, reports, computers, and various other devices (analog devices) from which desired data may be obtained.
Security Classification	Designate the highest security classification of the input.
Disposition After Processing	Identify what is to be done with the input following the processing of it.
Input Controls	Briefly describe proposed control procedures to be employed for the subject input. If applicable, identify all mandatory controls prescribed by regulation.
Desired/Required Sequence for Processing	Indicate the desired or required sequence of processing and the reason for the sequence (e.g., "Process cancellations prior to requisitions in order that stock file will not require updating twice").
Average Number of Input Data Fields per Input Transaction	Specify the average number of input data fields that are unique in content and/or format in a single input transaction.
Type of Processing	Give an indication of the type of processing envisioned (e.g., information storage, file updating, computational, data processing, etc.).
Origin	Identify each originator of the subject input in terms of echelon, organization within the echelon and geographical location. It is possible that the same type of input might have more than one place for origination.
Flow and Destination For Processing	Briefly describe the flow of the input and indicate where the information is processed. A separate entry is required for each "Origin".

ENTRY (Cont'd)	DESCRIPTION
Source Data Media	Specify the proposed media (documents, reports punched cards, magnetic tape, analog/digital transmission, etc.) in which the input will be received for processing. A separate entry is required for each "Origin/Destination" combination.
Frequency	Indicate the frequency at which the specified input will be submitted for processing. Where there are large variations in transaction volume within a specified frequency, this should be explained. One or more frequency entries are required for each "Origin/Destination" combination.
Average Number of Input Transactions	Specify an average or "estimated" number of input transactions that will be submitted for each specified frequency.
Timeliness	Specify all time constraints associated with the processing of submitted input data following final preparation of the data. Justify the time response requirements by references to regulations or operational requirements.

b. Output - Identify and describe the outputs that are currently required and envisioned for the proposed system. For complex systems having many different outputs, describe only those that are of primary importance to the operation of the proposed system and those that impact heavily upon the system workload. The form to be utilized for describing outputs is shown in Exhibit D-3. The form provides for the possibility that an output may have one origination point and more than one destination point. The form may be supplemented using plain sheets if additional space is required for some entries, but the format of the form should be followed and information provided for each entry. The title of the entry should precede the additional information to prevent misinterpretation. The entries on Exhibit D-3 are described as follows:

Output Title:						
Output Description:						
Output Trigger:						
Security Classification:						
Output Interface Constraints:						
Storage/Filing Constraints:						
Output Control:						
Average Number of Characters per Display Unit:						
Type of Processing:						
Origin	Destination	Media	Frequency	Avg. No. of Output Display Units/Copy	No. Copies	Timeliness

EXHIBIT D-3: GFSR OUTPUT DESCRIPTION

ENTRY	DESCRIPTION
Output Title	Identify the output to be described with a clear and complete title.
Output Description	Describe in narrative terms the general "Major reports or listings", general content and the general uses of the output. if required by regulation, it should be indicated.
Output Trigger	Describe the events that cause the output to be generated.
Security Classification	Designate the highest security classification of the output.
Output Interface Constraints	If applicable, describe the constraints placed on the system by other equipment that must receive and/or process the output.
Storage/Filing Constraints	If applicable, describe all constraints imposed by user storage and filing requirements.
Output Control	Briefly describe proposed output control procedures to be employed for checking the output and/or accounting for all copies, If applicable, identify all mandatory controls prescribed by regulation.
Average Number of Characters per Display Unit	Provide an estimate of the average number of characters to be printed on each page or the number of characters required for a display. If machine-readable output is to be produced indicate the number of characters per record or card.
Type of Processing	Give an indication of the type of processing envisioned to generate the output (e.g., information retrieval, computational, report generation, etc.).
Origin	Identify each originator of the output in terms of echelon, organization, and geographical location. It is possible that the same type of output might have more than one place for origination.

ENTRY (Cont'd)	DESCRIPTION
Destination	For each "Origin" identify the destination or recipient of the output in terms or echelon, organization, and geographical location.
Media	Specify the proposed and/or required media (hardcopy reports, punched cards, magnetic tape, CRT display, microfilm, analog/digital transmission, etc.) in which the output is to be presented to the recipient. A separate entry is required for each "Origin/Destination" combination.
Frequency	For each "Origin/Destination" combination, specify the frequency at which the output is to be produced. Where there are large variations in the output volume within a specified frequency, this should be explained.
Average Number of Output Display Units/ Copy	Specify an average or "estimated" number of output display units for a single copy of the output.
Number Copies	Indicate the average number of copies required each time the report is produced.
Timeliness	Indicate the maximum acceptable time between the output trigger and the production of the output.

c. Files - Identify and describe the proposed key files and their principal records which are currently required or envisioned for the proposed system. The form to be utilized for describing files is shown in Exhibit D-4.. The form may be supplemented using plain sheets if additional space is required for some entries, but the format of the form should be followed and information provided for each entry. The title of the entry should precede the additional information to prevent misinterpretation. The entries on Exhibit D-4 are described as follows:

File Title:
File Description:
Functional Use:
Current/Historical:
Type Processing:
Media:
Retention/Backup:
Security Classification:
Frequency of Use:
Approximate Number of Logical Records: Current: Projected:
Average Number of Data Fields/Logical Record:
Average Number of Characters/Logical Record:
Net Growth Rate:
Update Frequency:
Update Volume:
Remarks:

EXHIBIT D-4: GFSR FILE DESCRIPTION

ENTRY	DESCRIPTION
File Title	Enter the current file name if already existent or identify the proposed key file with a clear and complete title.
File Description	Provide a narrative description of the file, its principal logical records, and their general contents.
Functional Use	Describe the functional use of the file (i.e., the management functions which it supports, either directly or indirectly).
Current/Historical	Categorize the file as either "current" or "historical" in nature.
Type Processing	Indicate the type of processing envisioned for the file (e.g., query retrievals, report generation, computational, etc.).
Media	Indicate the proposed storage medium for the file.
Retention/Backup	Describe, including references to applicable regulations, the period during which the file must be retained and the requirement for backup or duplicate files.
Security Classification	Designate the highest security classification at which the file must be maintained.
Frequency of Use	Estimate how often the file will be used based on when retrievals and/or file manipulations are required in support of other processing requirements.
Approximate Number of Logical Records	Provide estimates of the current and/or projected number of logical records in the file.
Average Number of Data Fields/Logical Record	Provide an estimate of the average number of unique (content and/or format) data fields in an average logical record in the file.
Average Number of Characters/Logical Record	Provide an estimate of the average number of characters contained in an average logical record in the file.

ENTRY (Cont'd)	DESCRIPTION
Net Growth Rate	Indicate the net growth rate of the file as a function of time based on an estimate of file reductions and increases.
Update Frequency	Estimate how often file updates/additions/ and deletions will be performed.
Update Volume	Estimate the volume in logical records and/or data fields which will be involved during a file update.

10. Chapter 10: Performance Requirements

In this chapter, identify the indices by which the operating performance of the system should be measured, and the index of minimum acceptable performance in each case. Indices should be quantified, and demonstrably measurable. The intent is to clearly indicate just how often, how fast, how well, and/or at what maximum total or unit cost the system and its functional components must operate to be considered functionally acceptable. As in the case of operating policy, if differing performance is required under different operational environments, then the performance criteria must be separately stated for each such case.

11. Chapter 11: Required System Flexibility

In this chapter, identify and describe all significant requirements for systems options in terms of "on-call" changes in organization, policy or other significant system component, in order that provision for these options be incorporated in the ADP system design. The system options for "on-call" changes should refer to the various functions described in Chapter 2 and specifically identify those functions of the proposed management system where changes may be expected as well as describing these types of changes. This will permit the basic structure of the system to be designed to facilitate changes in approach without significant redesign and reprogramming of the supporting ADP system. Note that the flexibility requirements identified in this chapter are of the "day-to-day" variety within the basic operational environments described in Chapter 7.

12. Chapter 12: Requirements for Back-up Capability

In this chapter, identify all requirements for internal back-up among the various operating components of the system. This back-up could include the duplication of various operating components or the employment of fallback or bypass procedures. For example, if in a logistics management system it is required that designated depot-level processing centers be able to temporarily assume the workload of an inventory control center on which they are satellited, then this requirement must be stated, and all necessary details of workload distribution clearly described.

13. Chapter 13: Level of Automation Envisioned

The purpose of this chapter is to provide the functional proponent of the system an opportunity to identify and discuss the general level and concept of automation that he envisions for the system. In addition to a description of the general level and concept of automation, the functional proponent should specifically address those functions described in Chapter 2 that are recommended for automation. It is not to be construed as a requirement for ADP system design, but rather a discussion of concepts, in order that the designated ADP design agency be aware of the proponent's ideas on the subject of automation.

14. Chapter 14: Description of Current System

The purpose of this chapter is to establish a clear relationship between the system proposed in the GFSR and the system or systems which it would replace. This should be expressed not just in terms of the supporting ADP system but of all structural components. The current system should be described in general terms. Include where and by whom the functions of the current system, proposed system, are being performed, and identify ADP and communications support. Any difference between the current and proposed system that raises special problems in converting from one to the other should be identified and discussed at this point.

15. Chapter 15: Test, Installation and Conversion Concepts

The purpose of this chapter is to provide the functional proponent of the system an opportunity to identify requirements and general circumstances applicable to the period of transition from the old to the new system. This includes criteria for establishing the validity of the new system during formal system test, and any criteria, sequence, or approach regarded as functionally necessary during the process of installation and conversion. Additionally, the proponent's requirements for, or guidance concerning, location of prototype and the sequence of proliferation for multiple-unit systems should be included in this chapter.

16. Chapter 16: Resource Requirements

In this chapter, identify all known or anticipated requirements of functional resources to further develop, support, and operate the proposed system, under each of the categories defined below. In each case, also indicate the action that has been taken or is anticipated to satisfy the resource requirement. Where applicable, the statements of functional resources should be structured to support the preparation of an input to the Program Objective Memorandum (POM).

a. Functional Development and Maintenance - Funds and personnel required and programmed to prepare and maintain the Detailed Functional System Requirements and follow-on functional operating procedures.

b. System Operation:

(1) Functional personnel requirements, sources, and actions taken or anticipated.

(2) Functional facilities requirements, sources, and actions taken or anticipated.

(3) Funding actions required, initiated, and anticipated to support system operations. If an overall cost ceiling has been established for this system, then this also should be specified.

(4) Communications requirements and actions taken or anticipated to satisfy these.

17. Chapter 17: Benefits To Be Achieved

In this chapter, identify and describe the benefits that will be achieved through development and installation of the proposed system, including monetary savings (exclusive of ADP costs), operational performance benefits, improvements in readiness, personnel savings, and other benefits, either direct or indirect, as applicable. Also include a brief discussion on the major intangible benefits (benefits that cannot be costed) so that complete understanding of benefits is presented.

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13. ABSTRACT

This report is an appendix to "Functional System Requirements - Draft Changes to the General Functional System Requirements (GFSR) and the Detailed Functional System Requirements (DFSR)," AD 694[illegible]L. Changes are proposed to DA Pamphlet 18-5, Development and Maintenance of Multicommand ADP Systems, dated August 1969, as pertains to the General Functional System Requirements (GFSR) which is part of the ADP system life cycle concept.

14. KEY WORDS

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